SKOGEN
ENGINEERING GROUP, INC.

ACCIDENT ANALYSIS REPORT

Joshua Below vs. Yokohama Tire Corporation, et al

United States Court District of Wisconsin
Case No.: 3:15-CV-00529-WME

Prepared by

Dennis D. Skogen

of

Skogen Engineering Group, Inc.

Prepared for

Daniel A. Rottier

Habush, Habush & Rottier, SC

February 29, 2016

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INTRODUCTION

This report concerns an accident which occurred on September 14, 2013, in the westbound lanes of Interstate 94 in Monroe County, Wisconsin. The vehicle involved was a 2005 GMC K2500 extended cab pickup truck driven by Joshua Below. Mr. Below was severely injured when the right rear tire failed on his GMC pickup which caused his vehicle to enter into the grassy median between the westbound and eastbound lanes of Interstate 94. After entering the grassy median, the GMC pickup rolled over before coming to rest in the eastbound lanes of Interstate 94. The accident occurred during daylight hours and when the pavement surface was dry.

ENGINEERING QUALIFICATIONS

Prior to and after receiving my undergraduate degree in Mechanical Engineering from the University of Wisconsin-Madison, I designed machinery including mechanical devices, machine components and machine structures. After beginning my professional career as a draftsman at Gilman Engineering and Manufacturing in Janesville, Wisconsin, I was in charge of designing workstations on Automatic Assembly Equipment. My responsibilities included component selection and testing to ensure part capability, assembly station performance and machine structure durability. During and after my studies for my Bachelor of Science Degree in Mechanical Engineering, I was a machine designer at Gisholt Machine Tool Company in Madison, Wisconsin where I had design responsibility for four product lines of Non-Indexing Automatic Lathes. My responsibilities included the design and selection of the machine structures, machine components and mechanical devices to ensure successful, safe and reliable performance of the lathes used in metal removal. Of particular concern was the safety of operators and bystanders during machining of the metal work pieces which were being held in place and rotated during the metal removal process.

In 1970, I began working with Professor A. H. Easton who was a professor in Civil and Mechanical Engineering at the University of Wisconsin in Madison. Over the last forty-six years, I have analyzed in excess of 8000 cases involving vehicle accidents and machine design issues. I have a Master's of Science Degree in Mechanical Engineering from the University of Wisconsin in Madison where the courses I took included Mechanical Design, Accident Reconstruction, and Human Factors in Accident Causation. Undergraduate courses I took at the University of Wisconsin in Madison included Statics, Dynamics, and Strength of Materials which contribute to my engineering knowledge. I have been a Registered Professional Engineer in Wisconsin since 1971 and a copy of my curriculum vitae is attached as an addendum to this report along with a list of cases in which I have given testimony in depositions or trials over the last four years.

In this case as in the cases I have analyzed and reconstructed over the last 46 years, I have followed Standard Engineering Practices and established Protocol. The Protocol includes the initial assignment given by my clients and the application of Engineering Principals and Laws of Physics to fulfill the assignment to answer questions about the accident. In this case, we were asked to reconstruct the accident including a determination of the speed of the Below GMC pickup during the accident event.

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MATERIALS REVIEWED

As part of our engineering protocol, we obtained and analyzed materials that relate to the accident. In this case the materials included the following items:

1. The Wisconsin Motor Vehicle Accident Report as completed by the Wisconsin State Patrol.
2. Photographs taken at the accident scene by the investigating officers.
3. A supplemental witness statement that was given to the Wisconsin State Patrol by Chris Jensen.
4. A supplemental witness statement that was given to the Wisconsin State Patrol by Christopher Haefner.
5. Photographs that were taken by your office at the accident site on May 14, 2014.
6. Our inspection and survey of the accident site on August 11, 2014.
7. Our subsequent inspection of the accident site on November 17, 2014.
8. Our inspection of the failed Yokohama tire that had been on the right rear wheel of the 2005 GMC pickup.
9. Our inspection of a separated part of tire from the failed Yokohama tire that had been on the right rear wheel of the 2005 GMC pickup.
10. Our inspection of the four wheel rims that had been on the 2005 GMC pickup at the time of the accident.
11. An aerial photograph of the accident area. The aerial photograph was taken on October 12, 2013.
12. Photographs of the westbound lanes of Interstate 94 in the area of the accident which were taken in September of 2012.
13. The manufacturer's specifications for the 2005 GMC pickup.
14. Our enclosed scale drawing.

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INVESTIGATION

We began our investigation of this case after your inquiry of October 30, 2013. We subsequently received the above listed information. On August 11, 2014, we traveled to the accident site on I-94 in Monroe County, Wisconsin. The investigating officers' measurements and photographs taken at the accident scene were used to identify the area where the accident occurred. The accident site was surveyed in detail and the survey measurements were used in the preparation of the enclosed scale drawing in keeping with standard accepted engineering practice.

As shown on the drawing, in the area where the accident occurred the westbound lanes of I-94 travel in a northerly direction. The right hand through lane had an overall width of 12.2 feet while the left hand through lane had an overall width of 11.3 feet. A dashed white line separated the rightmost westbound lane from the leftmost westbound lane. A 10.9 foot wide asphalt paved shoulder was present along the east side of the westbound lanes. A white fog line separated the right-hand westbound lane from the paved shoulder. In addition, a 3.2 foot wide gravel shoulder was present along the eastern edge of the westbound pavement. A continuous yellow line identified the west side of the left westbound lane. An additional 3.8 foot wide asphalt paved shoulder and a 3.3 foot wide gravel shoulder were present along the western edge of the westbound lanes. Rumble strips were located in the left asphalt shoulder and the posted speed limit in the area was 65 miles per hour. The westbound lanes of I-94 are straight with a downgrade of 1.5 percent in the area where the accident took place. As shown on our drawing, a grassy median separated the westbound lanes from the eastbound lanes of I-94. During the course of our survey, items of debris from the GMC pickup and its cargo were identified in the grassy median. The items of debris that were noted are shown on our scale drawing.

Following Standard Accident Reconstruction Protocol, after the accident site was surveyed, the evidenced gathered and the scale drawing prepared, the location of evidence on the highway that can be seen in the accident scene photographs was placed on the scale drawing. In particular, the final rest position of the GMC pickup truck and the trailer that Mr. Below had been pulling was identified on the scale drawing. As shown in the police photographs, the pickup truck came to rest on its roof and facing in a southwesterly direction. Therefore, the GMC pickup rolled over during the accident events and when it was in the grass median.

In addition, tire marks that were left by the Below pickup truck and trailer that are shown in the investigating officers' photographs, extending from the right-hand westbound lane across the left-hand westbound lane and into the median were placed on the scale drawing. These tire marks from the Below pickup truck and trailer were then used to plot the pickup truck's path from its position in the westbound lanes to its final rest position

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ACCIDENT SEQUENCE

Based upon the available information, our scale drawing, the officers' photographs, and by following of the Standard Accident Reconstruction Protocol, the path traveled by the GMC pickup truck and attached trailer was identified. A scale model of the pickup truck and trailer and the marks left on the pavement in the westbound lanes and the marks and debris the vehicle left as it traveled into the median to its final rest position were used to determine the vehicle's path. From the distance of approximately 124 feet that the GMC pickup traveled during the rollover event, the vehicle rolled over two and one-half times to its right as it was yawing and traveling to the northwest to its final rest position.

Based upon the investigating officers' photographs, our survey and scale drawing of the accident scene including the location of debris and tire marks, we have determined that the accident sequence began when the right rear tire of the Below 2005 GMC pickup truck failed. The area of tire failure is identified by the presence of the separated part of tire from the failed right rear tire of the Below pickup truck that is shown on the west edge of the westbound lanes in the police photographs and as identified on our scale drawing. After the right rear tire failed, the GMC began to yaw or rotate counterclockwise as viewed from above. As the pickup and attached trailer continued in a northerly direction in the westbound lanes, the pickup continued to yaw. The GMC pickup then exited the west side of the westbound lanes and entered the grassy median. As shown by the location of debris, the GMC began to roll to its right and rolled over two and one-half times before coming to rest on its roof in the eastbound lanes, facing in a southwesterly direction.

Based upon Laws of Physics including the Conservation of Kinetic Energy, the speed of the GMC pickup truck and attached trailer may be determined. At the start of the tire marks in the westbound lanes that were caused by the GMC pickup, its speed was 58 to 63 miles per hour. Factors in the determination of the speed included the coefficient of friction or rate of slowing down for the GMC pickup as it traveled on the asphalt surface and as it traveled into the grassy median. The effects of road elevation change and the distance the vehicle traveled from the start of the marks to its final rest position were also incorporated in our determination of the speed of the vehicle at the start of the tire marks. It is our understanding that accident witness observations concerning the GMC's speed confirm our speed calculations.

CONCLUSIONS

In summary, the accident occurred when the right rear Yokohama tire on the GMC pickup suddenly failed which resulted in the GMC pickup initiating a yaw in a counterclockwise direction as the vehicle continued northbound in the westbound lanes. The speed of the GMC pickup in the area at the start of the yaw was 58 to 63 miles per hour. The GMC pickup continued to yaw as it traveled off the west side of the westbound lanes and entered the grass median. The GMC pickup rolled over two and one-half times with its right side leading until it came to rest in the eastbound lanes on its roof and facing in a southwesterly direction.

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If you have any questions or if I may be of further assistance, please contact me.

Very truly yours,

SKOGEN ENGINEERING GROUP, INC.

Wisconsin
Dennis D.
Skogen
E-12621
Madison
WI
Professional Engineer

Dennis D. Skogen
Professional Engineer
President

DDS/ms

Enclosure – Scale Drawing
Photographs
Photolog
Resume
List of Testimony

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PHOTOLOG FOR FILE NUMBER 26075

1 - 217 - These photographs were taken on November 4, 2013 at the Skogen Engineering Group shop. The photographs depict the wheel rims and the failed Yokohama tire that had been on the right rear wheel of the Below 2005 GMC pickup truck at the time of the accident.

218 - 271 - These photographs were taken during the course our accident site inspection that was completed on August 13, 2014.

272 - 330 - These photographs were taken on September 22, 2015 at the Skogen Engineering Group shop. The photographs depict the failed Yokohama tire that had been on the right rear wheel of the Below 2005 GMC pickup truck at the time of the accident.

331 - 336 - These photographs were taken on September 22, 2015 at the Skogen Engineering Group shop. The photographs depict a separated part of tire from the failed Yokohama tire.

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JAMES W. TORPY, BS, PARTNER

Dennis D. Skogen, MSME, PE

Date of Birth December 22, 1945

Professional Experience

Skogen Engineering Group, Inc. - 2002 – Present
Madison, WI

- President of Skogen Engineering Group, Inc.
- Partner
- Consulting engineer in accident investigation and reconstruction.

Safety Engineering Associates, Inc. - 1970 - 2001
Madison, WI

- President of Safety Engineering Associates, Inc.
- Vice President for four years
- Consulting engineer in accident investigation and reconstruction.

Gisholt Machine Company - 1967 - 1970
Madison, WI

- Design Supervisor and Senior Product Engineer of four Automatic Lathe Product Lines specializing in Machine Tool Safety Design

Gilman Engineering Manufacturing Company - 1964 - 1967
Janesville, WI

- Machine Designer of Automatic Assembly Systems

Areas of Consulting Activities Motor vehicle accident reconstruction, industrial and agricultural accident investigation and analysis, vehicle and machine testing, failure analysis and design analysis.

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Education

June 1969 - University of Wisconsin - Madison, WI

- Bachelor of Science Degree – Mechanical Engineering

May 1986 - University of Wisconsin - Madison, WI

- Master of Science Degree – Mechanical Engineering

Memberships/ Societies

- Society of Automotive Engineers - Lifetime member
- American Society of Mechanical Engineers - Lifetime member
- American Society of Agricultural and Biological Engineers
- Registered Wisconsin Professional Engineer
- National Society of Professional Engineers
- National Safety Council
- Pi Tau Sigma
- Phi Eta Sigma

Other Activities

Appointed to the City of Madison Engineering Council – 1973, 1974, 1975, 1976 and 1977

Special Consultant on Highway Safety to Governor of Wisconsin in 1977

Speaker at the Defense Research Institute and Civil Trial Counsel of Wisconsin

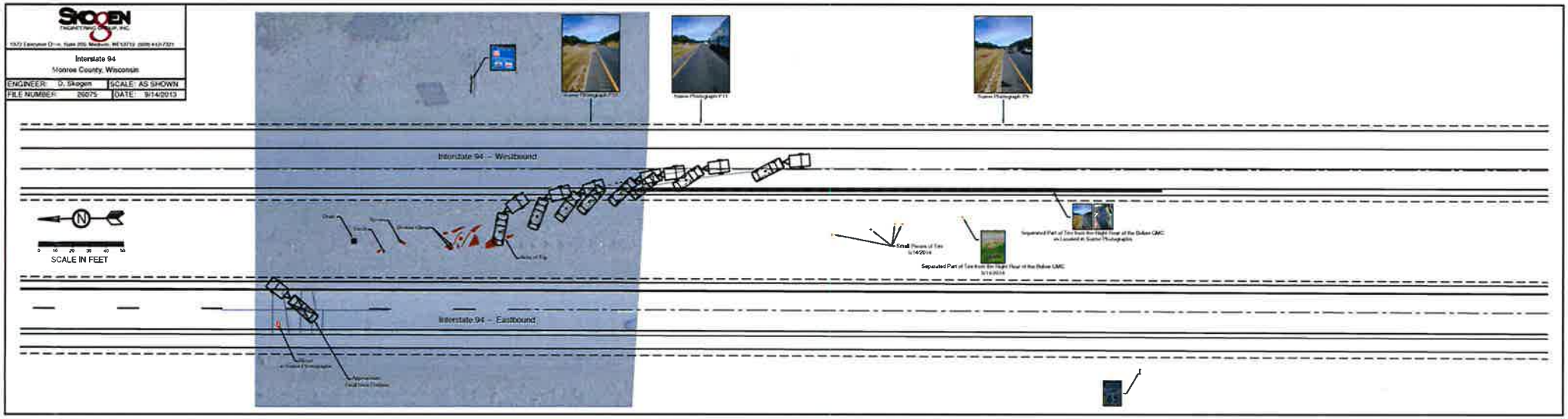
Speaker at the Wisconsin Academy of Trial Lawyers

Speaker at American Board of Trial Advocacy

Rule 26 List - Dennis D. Skogen

File Number	Deposition Date	Trial Date	Client	Case Name	Plaintiff/Defense (P/D)
24533	1/10/2011		Coffey, Patrick	Reinhold/Wallendal/Liner	D
24411		1/18/2011	LaFleur, Catherine	We-Energies/Miller/Peterson/Gawryl	D
23866		1/20/2011	Kost, Keith	Farmer/Rhinelander Transfer/Kotarsl	D
24504	5/17/2011		Doherty, Joseph	Wannow/Menards	P
24765	5/24/2011		Skow, Ardell	Holman/Holman	P
24795	5/31/2011		Varline, Daniel	J.Kimmes Const./Lakehead Blacktop	D
24409		7/13/2011	Davczyk, Spencer	Peterson/Hitt/Select & Better Hardwc	D
24985	8/29/2011		Hamilton, W. Craig	AGCO/Tucker	D
24360	8/31/2011		Averbeck, Charles	Smet/Franklin/Crete Carrier Corp.	P
25225	9/1/2011		Savage, George	Destree/Belanger	D
24841	9/16/2011		Whetter, Daniel	Nelson/Brantner/Saldana/Countrysid	P
25258		9/28/2011	Steans, Phillip	Storandt/Dixon/Krebs/State of Wisco	P
25337		9/28/2011	Dall'Ostro, Raymond	Frisbie/Baum/State of Wisconsin	D
24663	11/4/2011		Skow, Ardell	Brion/Myatt	P
25314		11/15/2011	Savage, George	Patz/Matz	D
25068	12/15/2011		Womble, W. T.	Low/Kubota	D
25102	1/13/2012		Tease, Ralph	Landolt/Doege/Steif	P
25172	2/1/2012		Jaskulski, Robert	Waranka	P
25361	2/2/2012		Brodd, Joel	Wingad/Quality Flooring	P
24651	2/10/2012		Carlson, James	McDonald/Kubota	D
25137	3/9/2012		Schaefer, Christy	Woodwrights, Inc./Fuehringer	D
24651		3/12/2012	Carlson, James	McDonald/Kubota	D
24232	5/9/2012		Duesing, Christopher	Smith/Polyock	P
25183		5/14/2012	Cutberth, Jane	Lasarge/Vesely	D
25370		6/21/2012	Vewys, Mark	Jervosek/Youngberg/Vandam/McKec	D
24529	7/19/2012		Skow, Ardell	Wilhelm/Mossey/Hughes	P
25386	7/25/2012		Carlson, James	Jernigan/Kubota	D
25572	8/1/2012		Laufenberg, Lynn	Esser/Quick	P
25228	8/2/2012		Davczyk, Spencer	Marth Transport/Kainz/Premier Tech	P
25172	9/26/2012		Jaskulski, Robert	Kruise/Blawat/Payne & Dolan	P
25167	9/28/2012		Lonergan, Kevin	Gernetzke/Vogel/Kreilkamp/Karel	P
25572		10/9/2010	Laufenberg, Lynn	Esser/Quick	P
24897	10/12/2012		Wachs, Dana/Beverly Wic	Lauer/Gertsen Interstate System/Joh	P
24842	10/23/2012		Domnitz, Merrick	Brodzik/Woehlert	P
25713		10/24/2012	Angell, John	Carter-Day/Kloehn	D
25295		10/30/2012	Cates, John	Wiegert/Harris/City of Madison	P
25508		12/10/2012	Whetter, Daniel	Baranowski/Stewart	P
25589		12/17/2012	LaFleur, Catherine	Koenig/Scharenbroch	D
25079	3/6/2013		Carlson, James	Nicholas/Yanmar	D
25589	4/4/2013		LaFleur, Catherine	Koenig/Scharenbroch	D
25020	4/11/2013		Foeckler, Allan	Kellner/Wosinski/O'Donnell Park	P
24999		4/16/2013	Reis, Jacob	Calkins/Stache/Lamers Bus Line	P
24647	5/22/2013		Simpson, Arthur	Chapman/Bissen/Bissen Asphalt	D
25422	6/13/2013		Crooks, Michael	Adams/Uniroyal Engineered Prod.	P
25511	7/24/2013		Wickstrom, Beverly	Lukes/Roberts/Dawe Rigging	P
25071	7/25/2013		Guelzow, Thomas	Michels/Polaris	P

25909	7/29/2013		Skow, Ardell	Hielkema/Butler	P
25535	8/28/2013		Brose, Michael	Maynes/Famous Daves	P
25334	10/7/2013		Skow, Ardell	Gunderson/Graff	P
25955	11/1/2013		Papendorf, Jarrod	Atkinson/Mills	D
25020	11/8/2013		Cannon, William	Kellner/Wosinski/O'Donnell Park	P
25904	12/10/2013		Skow, Ardell	Mork/Rogers	P
25842	12/27/2013		Mingo, Mark	Fluder/Edwards	D
25155	2/7/2014		Trecek, Timothy	Riek	P
24818	2/18/2014		Habush, Robert	Lacrosse/Voigt/Veolia	P
25661	4/21/2014		Pezze, Ronald	Andersen/Xu	D
25964	4/22/2014		Curtis, George	Crivello/Alar	P
24894	5/7/2014		Wachs, Dana	Lauer/Gertsen Interstate System/Joh	P
24681	5/15/2014		Trecek, Timothy	Hopgood/State of WI	P
25908	6/13/2014		Eckert, Michael	Bergeron	D
25535	7/11/2014		Brose, Michael	Maynes/Famous Daves	P
25531	7/14/2014		Tornehl, W. Ted	Pall/Jackson/Roehl Transport	D
25693	8/20/2014		Llaurado, Thadd	Barrera/Starline Mfg.	P
26006	9/12/2014		Skow, Ardell	Otis/Making Waves Salong	P
25661	9/16/2014		Pezze, Ronald	Andersen/Xu	D
25842	12/30/2014		Mingo, Mark	Fluder/Edwards	D
26138	2/4/2015		Tease, Ralph	McGray/Olson	P
25698	4/13/2015		Crooks, Michael	Gast/Sargento	P
25900	5/20/2015		Llaurado, Thadd	Westermeyer/Charter Steel	P
26314	6/2/2015		Crivello, Frank	Ejink/Hoth/Gollow/Feteic	P
26229	6/22/2015		Harding, Victor	Ahrens/We Energies	P
25274	6/30/2015		Offenbach, Dan	Lebanon Seaboard/Hughes	D
26395	9/9/2015		Moermond, James	Rother/West Wisconsin Transport/Crawford	D
26018	9/29/2015		Skow, Ardell	Derousseau/Bekcer/Lambert	P
26026	12/9/2015		Wachs, Dana	Mautz/Mautz	P
25909		12/21/2015	Skow, Ardell	Hielkema/Butler	P
25905		12/29/2015	Goss, Thomas	Spant/Holterman	D
	26313	2/23/2016	Algiers	Prust	P
	26444	2/26/2016	Richards	Cepukenas/Webb/Gardner	P


SKOGEN
Interstate 94
Monroe County, Wisconsin
ENGINEER: D. Skogen
SCALE: AS SHOWN
FILE NUMBER: 25075
DATE: 9/14/2013
Interstate 94 – Westbound
Interstate 94 – Eastbound
SCALE IN FEET

SKO 077